

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for multi-spectral image capture of a first scene, the method comprising:

acquiring a first series of images of the first scene with one or more image acquisition systems, each of the image acquisition systems having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity; ~~and~~

filtering each of the first series of images of the scene with a different filter from a set of non-interference, color filters, each of the non-interference filters in the set of the non-interference filters having a different spectral transmittance and is positioned between the scene and the one or more image acquisition systems; and

generating a multi-spectral scene description from the acquired first series of filtered images.

2. (Cancelled).

3. (Currently Amended) The method as set forth in claim [[2]] 1 further comprising:

acquiring a second series of images of a second scene with the one or more image acquisition systems; and

filtering each of the second series of images of the second scene with a different filter from the set of filters.

4. (Previously Presented) The method as set forth in claim 3 further comprising generating a characteristic mapping from two or more color channel signals from the second series of filtered images.

5. (Original) The method as set forth in claim 4 further comprising generating a spectral reflectance of the first scene from the multi-spectral scene description and the characteristic mapping.

6. (Original) The method as set forth in claim 5 further comprising using the generated spectral reflectance to reproduce the first scene.

7. (Original) The method as set forth in claim 5 further comprising storing the generated spectral reflectance for the first scene.

8. (Currently Amended) ~~The method as set forth in claim 1 further comprising~~ A method for multi-spectral image capture of a first scene, the method comprising:

acquiring a first series of images of the first scene with one or more image acquisition systems, each of the image acquisition systems having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity;

filtering each of the first series of images of the scene with a different filter from a set of non-interference, color filters, each of the non-interference filters in the set of the non-interference filters having a different spectral transmittance and is positioned between the scene and the one or more image acquisition systems; and

illuminating each image of the first series of images with one or more illuminants.

9. (Currently Amended) ~~The method as set forth in claim 1 further comprising~~ A method for multi-spectral image capture of a first scene, the method comprising:

acquiring a first series of images of the first scene with one or more image acquisition systems, each of the image acquisition systems having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity;

filtering each of the first series of images of the scene with a different filter from a set of non-interference, color filters, each of the non-interference filters in the set of the non-interference filters having a different spectral transmittance and is positioned between the scene and the one or more image acquisition systems; and

illuminating each image of the first series of images with an illuminant from a set of two or more illuminants as each of the first series of images is being acquired, each of the illuminants having a different spectral power distribution.

10. (Previously Presented) The method as set forth in claim 1 wherein the set of non-interference filters comprise at least one of an absorbance filter, a writable filter, and a liquid crystal tunable filter.

11. (Previously Presented) The method as set forth in claim 10 wherein the non-interference filters are the absorption filters.

12. (Currently Amended) An apparatus for multi-spectral image capture of a first scene, the apparatus comprising:

one or more image acquisition systems each having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity, each of the image acquisition devices acquiring a first series of images of the first scene; ~~and~~

a set of non-interference, color filters, each of the non-interference, filters in the set of the non-interference filters has a different spectral transmittance, is positioned between the scene and the image acquisition system, and filters a different image in the first series of images; and

a spectral image processing system which generates a multi-spectral scene description from the acquired first series of filtered images.

13. (Cancelled).

14. (Currently Amended) The apparatus as set forth in claim ~~[[13]]~~ 12 wherein the image acquisition systems acquire a second series of images of a second scene and the set of filters filter each of the second series of images of the second scene with a different filter.

15. (Previously Presented) The apparatus as set forth in claim 14 wherein the spectral image processing system generates a characteristic mapping from two or more color channel signals from the second series of filtered images.

16. (Original) The apparatus as set forth in claim 15 wherein the spectral image processing system generates a spectral reflectance of the first scene from the multi-spectral scene description and the characteristic mapping.

17. (Original) The apparatus as set forth in claim 16 further comprising a printing device to reproduce the first scene based on the generated spectral reflectance.

18. (Original) The apparatus as set forth in claim 16 further comprising a memory device for storing the generated spectral reflectance for the first scene.

19. (Currently Amended) ~~The apparatus as set forth in claim 12 further comprising~~ An apparatus for multi-spectral image capture of a first scene, the apparatus comprising:

one or more image acquisition systems each having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity, each of the image acquisition devices acquiring a first series of images of the first scene; and

a set of non-interference, color filters, each of the non-interference, filters in the set of the non-interference filters has a different spectral transmittance, is positioned between the scene and the image acquisition system, and filters a different image in the first series of images; and

one or more illuminants which illuminate each image of the first series of images.

20. (Currently Amended) ~~The apparatus as set forth in claim 12 further comprising~~ An apparatus for multi-spectral image capture of a first scene, the apparatus comprising:

one or more image acquisition systems each having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the

channels having a different spectral sensitivity, each of the image acquisition devices acquiring a first series of images of the first scene; and

a set of non-interference, color filters, each of the non-interference, filters in the set of the non-interference filters has a different spectral transmittance, is positioned between the scene and the image acquisition system, and filters a different image in the first series of images; and

a set of two or more illuminants, each of the illuminants having a different spectral power distribution and illuminating one of the images of the first series of images.

21. (Previously Presented) The apparatus as set forth in claim 12 wherein the set of non-interference filters comprise at least one of an absorbance filter, a writable filter, and a liquid crystal tunable filter.

22. (Previously Presented) The apparatus as set forth in claim 21 wherein the non-interference filters are the absorption filters.

23-36 (Canceled).

37. (Previously Presented) A method for multi-spectral image capture of a first scene, the method comprising:

acquiring a first series of images of the first scene with one or more image acquisition systems, each of the image acquisition systems having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the channels having a different spectral sensitivity;

illuminating each image of the first series of images with a different illuminant from a set of two or more illuminants, each illuminant having a different spectral power distribution;

generating a multi-spectral scene description from the acquired first series of filtered images;

acquiring a second series of images of a second scene with the one or more image acquisition systems;

illuminating each of the second series of images of the second scene differently; and
generating a characteristic mapping from the second series of filtered images.

38-40. (Canceled).

41. (Previously Presented) The method as set forth in claim 37 further comprising generating a spectral reflectance of the first scene from the multi-spectral scene description and the characteristic mapping.

42. (Original) The method as set forth in claim 41 further comprising using the generated spectral reflectance to reproduce the first scene.

43. (Original) The method as set forth in claim 42 further comprising storing the generated spectral reflectance for the first scene.

44. (Previously Presented) An apparatus for multi-spectral image capture of a first scene, the apparatus comprising:

an image acquisition system having an imaging sensor which has a set of color filters thereon and has two or more color channels, each of the color channels having a different spectral sensitivity;

a set of two or more illuminants, each illuminant having a different spectral power distribution and illuminating one of the images of the first scene; and

a spectral image processing system which generates a multi-spectral scene description from the acquired first series of filtered images;

wherein the image acquisition systems acquire a second series of images of a second scene and the set of color illuminants illuminate each of the second series of images of the second scene with a different spectral power distribution;

wherein the spectral image processing system generates a characteristic mapping from the second series of illuminated images.

45-47. (Canceled).

48. (Previously Presented) The apparatus as set forth in claim 44 wherein the spectral image processing system generates a spectral reflectance of the first scene from the multi-spectral scene description and the characteristic mapping.

49. (Original) The apparatus as set forth in claim 48 further comprising a printing device to reproduce the first scene based on the generated spectral reflectance.

50. (Original) The apparatus as set forth in claim 48 further comprising a memory device for storing the generated spectral reflectance for the first scene.

51-70. (Canceled).